

**Claims**

1. A biological sensor which incorporates
  - a) a first layered SAW device consisting of a piezoelectric crystal with interdigital electrodes on its surface, and second piezoelectric layer over said interdigital electrodes
  - b) a second layered SAW device consisting of a piezoelectric crystal with interdigital electrodes on its surface, a second piezoelectric layer over said interdigital electrodes and an analyte sensitive surface on said second piezoelectric layer
  - c) both saw devices are fabricated on the same substrate
  - d) reflectors are located adjacent the interdigital electrodes in each saw device to reduce the bandwidth of the device
  - e) the resonator circuits of each saw sensor incorporate amplifiers which are dependent .
2. A biological sensor as claimed in claim 1 in which the second layered device consists of a thin film layer with interdigital electrodes on its surface, a second piezoelectric layer over said interdigital electrodes and an analyte sensitive surface on said second piezoelectric layer.
3. A biological sensor as claimed in claim 1 in which the piezoelectric crystal is Lithium Niobate or Lithium Tantalate and the second piezoelectric layer is zinc oxide.
4. A biological sensor as claimed in claim 2 or 3 in which the analyte sensitive surface is gold.
5. A biological sensor as claimed in claim 2 or 3 in which the cavity length of the two SAW devices is not less than 90% of the centre to centre distance of the two devices.
6. A biological sensor as claimed in claim 2 or 3 in which the aperture size is approximately 200 wavelengths.

7. A biological sensor as claimed in claim 2 or 3 in which grooved gratings are used.